IT Recovery for Business to Take Off

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*Abstract-*Enterprise information technology is changed rapidly and it has also become the integral part and become a strategic asset to business. New technology coming today and adoption of it are helping IT applications to run faster, provide more efficient way for greater connectivity and creating newer business avenues for the organization. In all these changes there has been a constant. The constant is the underlying need to build and run a resilient IT that can recover on demand and be available continuously. This paper discusses some of the major issues and challenges that should need to address to run the business in today's scenario for business continuity management and IT disaster Recovery Management.

Keywords: IT, ITDRM, RTO, RPO, DR, SLA etc.

I.   INTRODUCTION

It is known to everyone that money attracts growth. To earn more money it is needed to secure mature infrastructure for information technology not only for right information within a very short time but also good disaster recovery plan also. A predictable and repeatable IT DR plan is the most consequential antidote to application outages. In the first half of 2011, the aftermath of disasters, such as the massive cyclones that struck the Australian state of Queensland, the catastrophic tsunamis that struck the northern portion of Japan following a major earthquake, and the hundreds of tornadoes that struck the central and south eastern portion of the US served to further reinforce to the business community at large the strong need for disaster recovery and business continuity readiness. In case of centralized information system it is needed to be implemented and managed effectively, a business continuity management program that can create a single place in the organization where mission critical business and technology processes are documented and managed. In 1991 restructuring were made to make the private sector from the government controls and also to improve the fiscal system. The experts feel that the focus was made to reform areas under agriculture, urban, human resources development and managing public services. So more and improvement is made by the help of coordination between private and public sector then information technology plays a major role and change the diversity of the business for competing with the global market . Now a day's disaster recovery solutions are the most integral part for the business organization also [1, 2, 4].

II.   DISASTER RECOVERY MANAGEMENT AND ITS IMPACT IN TODAY'S BUSINESS:

As more and more expansion of business is going on it is clear that best practices to monitor and manage IT recovery is needed. Disaster recovery solution basically consists of several physical subsystems and there should be a logical relationship between them. Physical subsystems are address to servers, applications, data replication, networks and storage (primary or secondary), primary data center and disaster recovery data center. Logical relationship should include order of recovery, independency between components and actions required to recover a subsystems. Disaster recovery management combines all these subsystems and relationships and provides a harmonization of IT system recovery. There are several common myths about IT recovery readiness. One of the biggest misconceptions is if the data replication is in place, then the application is recovery ready. Data replication is one of the important parts of the recovery readiness. The others include process, people and integration with technology subsystems on primary and DR site. All of these are required for performing predictable recovery. Whatever the business strategy the organization are used to survive in today's global competitive market but to assess organization's recovery readiness, they should be answer the following questions [3,7,9].
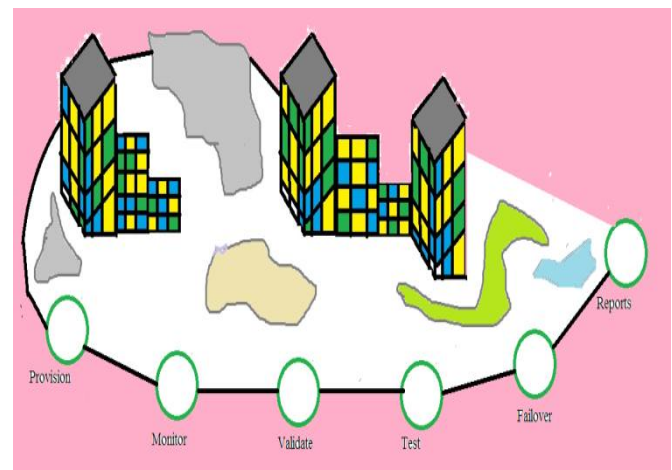

Figure 1.   Disaster Recovery Life Cycle

1)   Whether there should be a defined recovery point and recovery time objectives for the organization for all critical applications?

2)   When the last disaster recovery drill has been done and was it successful also?

3)   When performing the disaster recovery drill, whether it is found that the run book to be out of order for synchronization with the current configuration?

4) Whether disaster recovery drills delaying due to non availability or insufficient resources and also worried about impact to production?

5) Whether it is common to perform the DR drill for one, two or more applications. If it is then drill has been performed for several applications together and which will be required in the event of a larger outage?

6) Whether a management is interested in weekly or daily report on application recovery readiness status and recovery service line agreement (SLA) report?

7) Whether the reports and evidence are sufficient to show to audit and regulators about application's disaster recovery capability?

8) Whether the DR recovery will work smoothly if database administrator quits from the organization?

When answering the above questions it clear to understand that the capabilities of the disaster recovery and its challenges of having a disaster recovery solution that will work as when required [10, 14, 16].

III. MAJOR CHALLENGES FOR DISASTER RECOVERY

Business is suffered and creates a significant impact in the market when the critical applications are not available and cannot be recovered within business set recovery times. Major challenges are faced by the organizations in today and their groups are as follows:

A. Production downtime:

Manual drills and unpredictable outcomes cause a critical application is to be down for some time which also impacting the business.

B. Deployment and operational cost:

when every deployment of DR becomes a professional services engagement, cost and project times are also varying according to the requirement occurs.

C. Lack of visibility into SLA's:

when management and IT operations does not know if the recovery solution are meting service levels then it creates a lack of confidence in the operation and also reduced return on investment.

D. Manual operations:

when dependent on people to execute recovery procedures or steps at the time of emergency, crisis exposes the business in to more risks. People tend to make more mistakes when performing in case of crisis solution.

E. Need for DR expertise:

A typical enterprise uses heterogeneous technologies. In that case dependent on a single person or a dashboard to monitor and provide the recovery solution and drill steps, the organization dependent on the various technology experts to be available
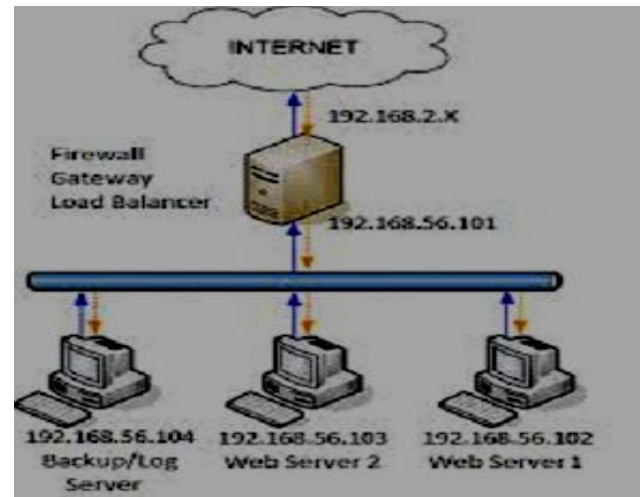

Figure 2. Typical server hierarchy in network

IV. DISASTERS RECOVERY MANAGEMENT – A CHALLENGING APPROACH FOR IT RECOVERY:

IT disasters recovery management is a challenging and emerging discipline that enables IT to meet business set recovery objectives. In today's global and competitive business market without IT DRM, IT recovery is largely manual, highly expertise dependent and with little visibility into how well recovery services levels are being met to survive in the business. Every DR solution for any application must be designed to meet certain key DR metrics and also consists of DR process that must be covered by a DR solution [13, 15, 17].

A. Key DR Metrics

a) Recovery point objectives:

It is the amount of application data in time that an organization can afford to lose before it adversely impacts the business but it is also dependent on the organization whether it allows or not . For example a bank that cannot afford to lose any data for its ATM application, hence its RPO is zero.

b) Recovery time objectives:

It is the amount of time an application can be down due to recovery purpose. For example an application with a RTO of two hours that must be recovered within two hours and after it becomes unavailable due to an outage.
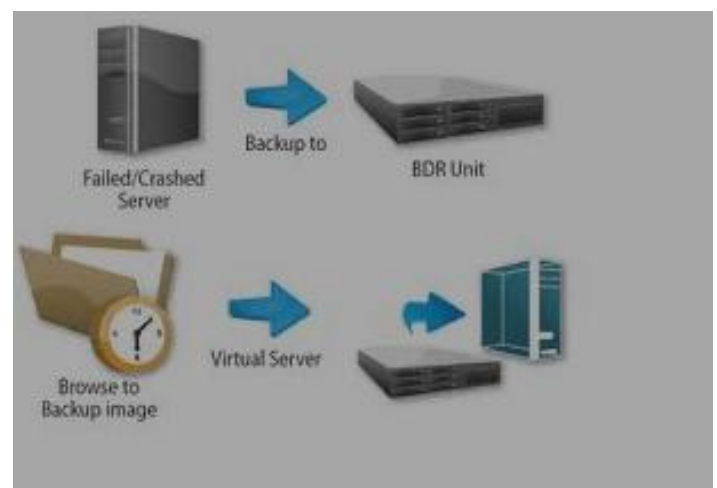

Figure 3. Backup policies in DR

c) Data log:

This will specify the amount of data that the disaster recovery site is having in behind the primary production site. The unit of data log is dependent on the unit are used to measure the size of the data. It can be dependent on the technology deployed to replicate data and is usually measured in the MB or GB or the number of files.
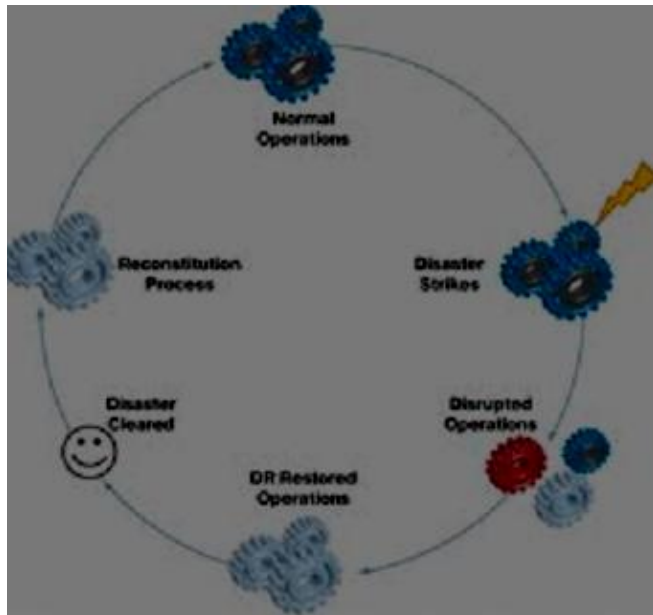

Figure 4. Typical disasters recovery cycle

B. DR Process:

There are several processes that are part of the disasters recovery solution and that must be thought out and designed for to achieve better recovery plan. There must be a run book that has a series of predefined steps that must be consulted for each of the DR processes.

- Provision:

Deploy the best practices for DR solution for the application by deploying best of the DR infrastructure, and best practice, procedures recommended by application vendors for the best options.

- Monitoring:

Perform a real time monitoring of DR metrics and its parameters to ensure the objectives of the DR systems are met and it healthy in operational.

- Validation:

Perform daily /weakly configuration checking to ensure that DR systems are up-to-date with production systems with regards to ongoing change management updates.

- Test/DR Drills:

Perform quarterly and half yearly DR drills which include switchover and switchback on the application at the DR site and also validate the DR operational readiness capability. Here switchover basically means when production is brought down and services are made available from the DR site. The business user basically tests the application that has come up with the DR system.

The switchback process moves services back to the production and normal copy process resumes.

- Failover Recovery:

Document and automate the application recovery steps which include failover and fallback procedures for different scenarios. Recover the applications successfully within the recovery time objectives, when invoked under crisis is occurred. When an outage occurs on the production, then the corresponding failover process is invoked to recover desired services on the DR. after the cause of the outage has been identified the fallback process covers the steps to move the services back to the corresponding production site.

- Reports:

Provide yearly audit and compliance report on DR drills and other DR activities to meet regulatory requirements. Furnish weekly reports on DR status to the management and applications owners in the organization to ensure the acceptance of DR systems.

V. CAPABILITIES OF THE IT DRM SOFTWARE:

IT DRM software must offer better capabilities to monitor and report on DR metrics as well as provide automation of all of the DR processes. The solution must offer the following mentioned capabilities

A. Monitoring and validation of recovery service levels:

Recovery point and recovery time are metrics that need to be monitored for a DR solution. Real time monitoring of Recovery point objectives (RPO) and Recovery time objectives (RTO) should ensure that the applications are meeting their recovery objectives with full potential.

B. Automation of failover and DR Drill processes:

In the life cycle of DR solution there are several stages requiring several steps to be performed to successfully secure the business data. Failover is a series of steps that bring up the application on the DR site when the primary site has gone down due some unavoidable circumstances. Switchover is a series of steps that shuts down the primary and brings up the DR in a planned manner for better operational characteristics of business. Automation of these steps ensures the DR process takes place in predictable and reliable manner [18, 20, 21].

C. Unified management approach that takes an application view of recovery :

In that case application recovery requires the various components including operating systems, network, storage, data protection and applications are recovery ready. A unified approach is to be applied to ensure that the interface can help and manage a complete view that includes event management across the stack.

D. Analytics and reporting for compliance and regulatory purposes :

Regulatory authorities require evidence of control that also demonstrates that drills have been conducted. RPO and RTO trending reports that helps the IT managers identify saturation of resources like network bandwidth and specially draw focus on the recovery steps that are also time consuming and laborious also[4,5,10].

VI. DRM AND ITS BENEFITS AND IMPACTS IN BUSINESS:

Recovery manager is built upon a powerful automation engine that understands and combines dependencies that required for successful recovery applications. A central web based console offers an easy way to collaborate execution and status tracking of recovery actions as they execute and fully operational [14, 16, 18]. DRM enables the following business benefits which are as follows

A. Reduce business exposure to IT outages:

Non availability of IT applications poses a huge business risk. But this think can be easily overcome by ensuring IT recovery readiness. Which enables information technology to recover applications within the business set recovery objectives and thus minimizing the impact of IT outages.

1) Achieve higher operational efficiency:

By means of cheaper cost, faster in execution and recover an IT applications in a scalable manner.

2) Adopt industry best practices :

Successful recovery is achieved by help of expert IT professional, mature process and robust technologies. IT recovery process easily integrates with best practices of incidents, configuration, and change, audit and service level management processes.

3) Validate complex recovery for multi-vendor physical / virtual environments.

4) Real time checking into application data loss and recovery time.

5) Rapidly identify causes of recovery test failures and identify the appropriate solutions.

6) Designing the recovery workflows in such a way that meet the service levels, RPO and RTO objectives very efficiently.

7) Global recovery audit reporting and documentation.

VII. COMPARISON FOR COST OF DOING DR OPERATION FOR TRADITIONAL APPROACH VS DR MANAGEMENT SOFTWARE:

Traditional Approach	DR Management Software
Personal required for DR where DR team works on DR strategy, plan readiness, co ordination amongst various teams and DR readiness reporting process.	The DR team size does not need to be increase in size with the addition of number application under DR. central web based console for coordination and inbuilt DR best practices help the team manage more applications.
IT process of change, policy, backup management that is implemented on the primary site must also be implemented on the DR site also. Event monitoring, exception reporting and service line agreement compliance and analytics are part of DR process.	Real time monitoring of DR health and data replication, validation of primary and DR environment equivalence and exception reporting when DR SLA's are not being met and also drive down the operational cost heavily while increasing DR readiness.
DR automation which also involves automation steps for doing DR drill and failover recovery.	Using DR automation it is found that there will be significant reduction in people cost of doing DR drill.

VIII. TYPES OF RECOVERY SERVICES AND ITS IMPACTS

A. Data dependency mapping technology

This is basically are software products that determine and report on the likelihood of achieving specified recovery targets based on analyzing and correlating data from applications , databases , clusters ,OS, virtual systems, networking and storage replication mechanisms. One technology approach also being taken by different vendors is the use of well defined storage management problem "signatures" supported by industry standard storage and data management software, in combination with the passive traffic monitoring of local and remote storage traffic.

B. Recovery exercising:

This is basically set of sequenced testing tasks typically performed at a recovery data center facility that are focused on ensuring that the access and usage of a production application can be restarted within a specified time period with the required level of data consistency and an acceptable level of data loss. As the recovery scope of mission critical business processes, applications and data increases, however sustaining the quality and consistency of recovery exercises can be a daunting technical and logistical challenge,

especially as the frequency with which recovery exercises are held increases, in addition to increased change frequency also.

C. Cloud based recovery services

These services are delivered by public cloud providers and are primarily infrastructure as a service. These include recovery in the cloud and also cloud based storage services. This service basically supports a combination of server image and production data backup to the service provider's data center. When the access to the replicated server images and production data is required by the customer for plan exercising or to support live recovery operations, the server images are dynamically restored to available hardware and reactivated.

The recovery in the cloud value proposition is twofold. First, because server restoration on demand does not require any pre allocation of specific computing resources and provider customers have the opportunity to exercise their recovery plans more frequently. Second, because server images are restored to providers' server hardware when needed, and production data has already been stored inside the provider cloud, the need for either shared–subscription or

dedicated server and storage equipment can be significantly reduced, if not totally eliminated.

D. Virtual Machine Recovery

It focuses on protecting and recovering data from VMs, as opposed to the physical server the VMs, as run on or non virtualized systems. Sever virtualization for the X 86 platforms from vendors like VMware, Citrix systems and Microsoft is gaining considerable attention and the deployment of X86 VMs is growing at roughly 50% every year.

VM recovery solutions help recover from problems including user, application or administrator error, such as the accidental deletion or overwrite of a file, logical errors such as viruses, physical errors, such as disk failures, and disaster recovery errors, such as site loss. Further it can also offer improved granular recovery of data/ files in a VM environment, in addition to the entire VM.

IX. CONCLUSION

From the above discussion it can be easily understand the actual power of disaster recovery management. In business critical applications are meeting RPO goals. Providing timely alerts when the RPO deviates to enable timely re mediation that ensures critical application are always recovery ready. The primary reason organization deploy disaster recovery solutions is to reduce the financial impact of IT outages. DR automation drives the return on investments of DR management software in two key areas. DR automation enables scaling of DR drills as more applications need to be tested at regular times. Secondly with a single button failover recovery of applications can increase the confidence to invoke application on the DR site dramatically and resulting in reduced downtime and also higher utilization of DR assets.

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